

Amendments to the Claims

This listing of the claims will replace all prior versions, and listings of claims in the application:

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Listing of Claims

1. (currently amended) A mechanism controlling a voice coil, comprising:

means for reducing a gain of a PES within a disk vibration frequency range;

10 wherein said disk vibration frequency range includes frequencies between at least 1000 Herz and at most 3000 Herz; and

means for increasing said gain of said PES within a lower frequency range; wherein said lower frequency range includes frequencies between at least 16 Herz and at most 800 Herz;

15 wherein said voice coil drives an actuator arm positioning a head gimbal assembly for a read-write head communicatively accessing a track on a rotating disk surface to generate said PES;

wherein said PES is a function of said head gimbal assembly responding to mechanical vibrations in said rotating disk surface by providing said read-write head with radial motion toward said track;

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wherein said head gimbal assembly, comprises:

means for moving said slider parallel to said disk surface toward said track, when said disk surface is flat, by an actuator arm moving said slider by a lever action through a principal axis with said slider aligned at a bias angle;

25 means for radially moving said slider toward said track when said disk surface is bent, by said lever action through said principal axis at said bias angle causing said slider to move radially toward said track, when said disk surface is bent.

2. (original) The mechanism of Claim 1, wherein the means for increasing said gain of said PES further comprising:

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means for increasing a first of said gain of said PES within a first lower frequency range; and

means for increasing a second of said gain of said PES within a second lower frequency range;

5 wherein said first lower frequency range and said second lower frequency range both consist essentially of frequencies within said lower frequency range;

wherein frequencies belonging to said first lower frequency range are smaller than said frequencies belonging to said second frequency range; and

wherein said first gain is larger than said second gain.

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3. (original) The mechanism of Claim 2, wherein said second gain is between 0.9 and 1.1.

4. (original) The mechanism of Claim 3, wherein said first gain is at least one
15 and one half times said second gain.

5. (original) The mechanism of Claim 4, wherein said first gain is at least two times said second gain.

20 6. (original) A hard disk drive comprising: said controlling mechanism as in Claim 1; and

said voice coil, said actuator arm, said head gimbal assembly with said read-write head, said rotating disk surface, and a channel interface generating said PES signal based upon said read-write head communicating with said rotating disk surface.

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7. (cancelled)

8. (original) The mechanism of Claim 7, wherein the means for moving said slider parallel said disk surface further comprising means for said actuator arm moving,
30 through a flexure, said slider mounted to said flexure at a second bias angle to said principal axis;

wherein the means for radially moving said slider further comprising: said flexure responding as said disk surface is bent, through said second bias angle, causing said slider to move radially toward said track.

5 9. (original) The mechanism of Claim 7, wherein the means for moving said slider parallel said disk surface further comprising: means for moving said actuator arm by a level action through a principal axis with said slider parallel said disk surface and flexibly mounted by a flexure at a second bias angle to said actuator arm; and

10 wherein the means for radially moving said slider further comprising: means for said flexure responding as said disk surface is bent through said second bias angle causing said slider to radially move toward said track.

15 10. (original) The mechanism of Claim 7, wherein said actuator arm is coupled to said load beam via a first finger and a second finger; wherein said first finger flexes differently from said second finger when said disk surface is bent; and

 wherein the means for radially moving said slider further comprises said first finger flexing differently from said second finger flexing to cause said slider moving radially toward said track, when said disk surface is bent.

20 11. (original) The mechanism of Claim 1, wherein at least one member of a reducing-increasing means collection is implemented using at least one member of the collection comprising a finite state machine, a computer, and a program step residing in a memory accessibly coupled to said computer;

25 wherein said reducing-increasing means collection comprising said means for reducing said gain of said PES within said disk vibration frequency range, and

 said means for increasing said gain of said PES within said lower frequency range.

30 12. (currently amended) A method of controlling a voice coil in a hard disk drive, comprising the steps of:

reducing a gain of a PES within a disk vibration frequency range; wherein said disk vibration frequency range includes frequencies between at least 1000 Herz and at most 3000 Herz; and

increasing said gain of said PES within a lower frequency range; wherein said
5 lower frequency range includes frequencies between at least 20 Herz and at most 800 Herz;

said head gimbal assembly responding to mechanical vibrations in said rotating disk surface by providing said read-write head with radial motion toward said track, further comprising the steps of:

10 moving said slider parallel to said disk surface toward said track, when said disk surface is flat, by an actuator arm moving said slider by a lever action through a principal axis with said slider aligned at a bias angle, further comprising one of the steps of:

said actuator arm moving, through a flexure, said slider mounted to said flexure at a second bias angle to said principal axis; and

15 moving said actuator arm by a level action through a principal axis with said slider parallel said disk surface and flexibly mounted by said flexure at said second bias angle to said actuator arm; and

radially moving said slider toward said track when said disk surface is bent, by said lever action through said principal axis at said bias angle causing said slider to move
20 radially toward said track, when said disk surface is bent, further comprising one of the steps of:

said flexure responding as said disk surface is bent, through said second bias angle, causing said slider to move radially toward said track; and

25 said flexure responding as said disk surface is bent through said second bias angle causing said slider to radially move toward said track;

wherein said voice coil drives an actuator arm positioning a said head gimbal assembly for a read-write head communicatively accessing a track on a said rotating disk surface to generate said PES; and

wherein said PES is a function of said head gimbal assembly responding to
30 mechanical vibrations in said rotating disk surface by providing said read-write head with radial motion toward said track.

13. (original) The method of Claim 12, wherein the step increasing said gain of said PES further comprising the steps of:

increasing a first of said gain of said PES within a first lower frequency range;

5 and

increasing a second of said gain of said PES within a second lower frequency range;

wherein said first lower frequency range and said second lower frequency range both consist essentially of frequencies within said lower frequency range;

10 wherein frequencies belonging to said first lower frequency range are smaller than said frequencies belonging to said second frequency range; and

wherein said first gain is larger than said second gain.

14. (original) The method of Claim 13, wherein said second gain is between 0.9
15 and 1.1.

15. (original) The method of Claim 14, wherein said first gain is at least one and one half times said second gain.

20 16. (original) The method of Claim 15, wherein said first gain is at least two times said second gain.

17. (original) A method making at least one member of the collection including a servo controller and a hard disk drive, comprising the steps:

25 making said servo-controller as means for the steps of Claim 12; and

making said hard disk drive using said servo-controller to control said voice coil driving said actuator arm coupled to said head gimbal assembly with said read-write head communicatively accessing tracks on said rotating disk surface in said hard disk drive.

30 18. (original) Said servo-controller and said disk drive as products of Claim 17.

19. (cancelled)

20. (cancelled)

5 21. (cancelled)

22. (original) The method of Claim 19,

wherein said actuator arm is coupled to said load beam via a first finger and a
second finger; wherein said first finger flexes differently from said second finger when
10 said disk surface is bent; and

wherein the step radially moving said slider further comprising the step of said
first finger flexing differently from said second finger flexing to cause said slider moving
radially toward said track, when said disk surface is bent.